

Climatological Data for July, 1909.
DISTRICT No. 4, LAKE REGION.

Prof. HENRY J. COX, District Editor.

TEMPERATURE.

The mean temperature for the month was below the normal generally throughout the district, except in the northern portions of both the upper and the lower peninsulas of Michigan and the Wisconsin shores of Lakes Superior and Michigan. In these sections the mean temperature was slightly above the normal. The deficiency was greatest in the extreme southwestern portion of Lower Michigan, northeastern Indiana, and in the region of the lower Lakes. The departures reached -5.3° at South Haven Mich., -5.3° at Auburn, Ind., -4.5° at Hudson, O., and -4.5° at Canton, N. Y.

A cool wave advanced across the district from the 2d to the 10th, and during its passage minimum temperatures considerably lower than 50° were recorded in nearly all sections. On the 9th, temperature in parts of the Adirondack region fell to the freezing point or below, the lowest reading being 30° at Gabriels, Franklin County, N. Y. A second cool wave crossed the district from the 16th to 25th, but temperature generally was not as low as during the preceding cool period.

Between these cool periods was a season of warm weather, during which the highest temperature readings of the month east of the 85th meridian were recorded on the 12th to 15th, inclusive. The highest temperature readings of the month over the western portions of the district occurred on the 28th and 29th, and the month closed with temperature in all sections generally above the seasonal average.

PRECIPITATION.

The precipitation was very unevenly distributed. It was above the normal amount for the month over the southeastern portion of the lower peninsula of Michigan and the southern shore of Lake Ontario, and was exceptionally heavy over the region of western Lake Superior. Elsewhere, except over very limited areas, the rainfall was deficient. Along the western

shore of Lower Michigan, in the greater portion of the Fox River Valley of Wisconsin, the Miami River Valley of Ohio, and the interior portions of New York State the lack of rainfall was such as to retard the growth of crops and injure the pastures. In the last-named section the deficiency caused a serious reduction of the water supply for many cities and towns, and even for stock on farms.

The greatest monthly precipitation occurring at any station in the district was 15.45 inches at Ironwood, Mich., and the least, 0.25 inch at Manistee, Mich.

Four rainy periods—1st-4th, 9-16th, 19-24th, 28th-31st—were quite well marked over the western portions of the district, but in the eastern sections the rainfall was more evenly distributed throughout the month. Very heavy rains which resulted in destructive floods occurred in the region of western Lake Superior on the 20th to 22d, and heavy twenty-four hour falls were recorded as follows: Duluth, Minn., 5.35 inches; Herbster, Wis., 5.20 inches; Thomaston, Mich., 5.50 inches; Ironwood, Mich., 6.72 inches on the 21st and 5.00 inches on the 22d. The amount measured at Ironwood on the 21st is the greatest twenty-four hour rainfall recorded in Michigan during the past twenty-three years.

A number of thunderstorms, accompanied in localities by hail and high winds, occurred over the Indiana and Ohio portions of the district from the 12th to 15th, doing considerable damage to crops and trees, buildings, and telephone and telegraph wires. Hail fell generally over Ohio on the 15th, and on this date at Lima unusually large hailstones damaged windows and tender crops. Damaging thunderstorms and high winds were also reported from Fulton, Lake, Sandusky, and Seneca counties in Ohio, on the 29th. Over the portions of the district farther east, however, only a few heavy thunderstorms occurred during the month, and the damage from high winds was not great.

TABLE 1.—Climatological data for July, 1909. District No. 4, Lake Region.

Table with columns: Stations, Counties, Elevation, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Total snowfall unmelting), Sky (Number of rainy days, Number of clear days, Number of partly cloudy days, Number of cloudy days), Prevailing wind direction, Observers.

TABLE 1.—Climatological data for July, 1909. District No. 4—Continued.

Table with columns: Stations, Counties, Elevation, Length of record, Temperature (Mean, Departure from normal, Highest, Date, Lowest, Date, Greatest daily range), Precipitation (Total, Departure from normal, Greatest in 24 hours, Total snowfall unmelting), Number of rainy days, Sky (Number of partly cloudy days, Number of cloudy days), Prevailing wind direction, Observers.

TABLE 1.—Climatological data for July, 1909. District No. 4—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, yrs.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.				Sky.				Observers.		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall unmelted.	Number of rainy days, all or more.	Number of clear days.	Number of partly cloudy days.		Number of cloudy days.	Prevailing wind direction.
<i>Ohio—Cont'd.</i>																				
Upper Sandusky	Wyandot	854	27	71.3	- 2.5	90	12	48	19	34	1.45	- 2.12	0.45	0.0	4	17	13	1	sw.	R. S. Kiefer.
Vickery	Sandusky	588	17	70.5	- 2.8	94	12	48	4	37	5.50	+ 1.37	2.64	0.0	10	8	19	4	s.	John W. Barr.
Wauseon	Fulton	780	40	70.3	- 2.6	92	28	47	19	36	3.78	- 0.53	1.16	0.0	10	13	13	5	s.	Thomas Mikesell.
Wellington	Lorain	856	17	70.4	- 3.1	94	12	41	20	46	4.32	+ 0.10	2.05	0.0	10	23	5	3	s.	W. D. Warren.
Willoughby	Lake										2.77	- 0.81	0.86	0.0	6	12	14	5	n.	C. J. Richardson.
<i>Pennsylvania.</i>																				
Erie	Erie	713	36	69.2	- 2.1	89	12	52	5	22	2.46	- 0.75	0.76	0.0	9	11	14	6	w.	U. S. Weather Bureau.
<i>New York.</i>																				
Adams Center	Jefferson	540	18	68.5		89	15	50	6	30	5.14	+ 0.60	0.95	0.0	13	18	11	2	s.	A. E. Cooley.
Angelica	Allegany	1,340	26	64.9	- 3.0	88	11	33	5	50	1.37	- 2.79	0.43	0.0	11	7	16	3	nw.	Charles P. Arnold.
Appleton	Niagara	270	18	68.9	- 0.7	89	10	47	5	32	3.21	- 1.00	0.64	0.0	9	18	9	4	nw.	H. A. Van Wagoner.
Auburn	Cayuga	715	40	68.0	- 2.5	90	15	47	5	30	4.32	+ 0.10	2.05	0.0	9	23	5	3	n.	A. H. Underwood.
Avon	Livingston	585	14	67.8	- 3.8	89	10	45	5	34	3.52	- 0.42	0.90	0.0	9	18	6	7	n.	W. G. Markham.
Benson Mines	St. Lawrence																			
Blue Mountain Lake	Hamilton	1,750	9																	
Brockport	Monroe	537	13	68.0	- 3.2	88	11	50	4	33	5.48	+ 1.16	1.66	0.0	13	18	8	5	sw.	W. H. Lennon.
Buffalo	Erie	767	58	68.6	- 1.6	83	11	51	24	22	2.49	- 0.91	0.67	0.0	10	12	12	7	sw.	U. S. Weather Bureau.
Canton	St. Lawrence	448	15	66.0	- 4.5	88	15	42	9	36	3.35	+ 0.12	0.84	0.0	16	12	11	8	sw.	Do.
Cape Vincent	Jefferson	246	4	66.4		84	15	45	8	29	3.94		0.86	0.0	13	10	14	7	sw.	V. M. Rice.
Carvers Falls	Washington	243	11	66.6	- 2.2	90	30	43	5	33	1.70	- 2.04	0.60	0.0	8	17	10	4	a.	W. Fancher.
Chazy	Clinton	151	10	67.0		90	15	44	10	34	1.00		0.45	0.0	6	21	2	8	n.	W. R. North.
Dannemora	do	1,490	4	65.9		85	16	45	4	29	3.12		0.78	0.0	9	5	13	13	w.	W. N. Thayer.
Elba	Genesee	500	10	67.2		89	10	46	5	36	4.83		1.36	0.0	11	18	4	9	sw.	Jos. S. Wilfert.
Faust ^b	Franklin	1,552	9	63.0		85	15	40	9	37	3.55		0.77	0.0	17				sw.	Aaron W. Maddox.
Fayetteville	Onondaga	530	8	68.8		90	11	46	5	37	2.50		0.84	0.0	8	13	13	5	nw.	D. H. Wells.
Gabriels	Franklin	1,729	7	62.6		87	15	40	9	50	4.72		0.71	0.0	14	10	14	7	w.	W. S. Everham.
Harkness	Clinton	622	6	67.0		89	15	44	9	31	2.64		1.14	0.0	9	21	8	2	w.	J. W. Harkness.
Hemlock Lake	Livingston	900	11	67.8	- 3.4	86	15	47	7	34	2.44	- 1.74	0.72	0.0	6	17	7	7	nw.	D. H. Westbury.
Hunt	do	1,321	10	67.8		88	12	42	7	36	2.41		1.13	0.0	8	7	21	3	nw.	W. S. Barrager.
Ithaca	Tompkins	928	31	68.7	- 1.9	90	15	43	9	39	1.62	- 2.13	0.78	0.0	11	12	15	4	nw.	U. S. Weather Bureau.
Keene Valley	Essex	1,000	11	65.2	- 1.6	92	15	37	9	44	3.26	- 1.07	0.73	0.0	13	9	12	10	sw.	E. R. Wells.
Keuka Park	Yates	750	63	69.3		93	15	44	9	40	1.15	- 2.17	0.25	0.0	9	15	9	7	nw.	Dean L. Myers.
King Ferry	Cayuga										2.10	- 2.32	0.45	0.0	10	17	9	5	w.	L. A. Goodyear.
Lake George	Warren	350	4	67.6		91	15	44	5	37	2.13		0.73	0.0	8	10	17	4	nc.	Charles Forsell.
Lake Placid Club	Essex	1,864	1	59.0		81	15	39	7	31	5.20		0.91	0.0	19	12	13	6	nw.	Henry Van Hovenberg.
Le Roy	Genesee	920	19	68.2	- 0.5	88	28	48	5	35	4.46	+ 1.25	1.64	0.0	14	10	9	12	nw.	F. W. Ball.
Lockport	Niagara	650	22	69.1	- 1.5	89	11	50	5	28	5.09	+ 1.42	1.56	0.0	11	16	7	8	sw.	J. E. Wakeman.
Lowville	Lewis	900	42	65.4	- 2.1	90	15	37	9	44	2.73	- 1.10	0.62	0.0	10	15	6	10	w.	Charles J. Rice.
Lyndonville	Orleans										3.53	- 0.18	1.45	0.0	6	23	5	3	sw.	W. S. John.
Mora	Franklin	200	9	67.4		93	15	44	9	34	3.05		0.67	0.0	10	7	15	9	w.	C. E. McBride.
Nehassee	Hamilton	1,750	1	61.2		86	15	32	9	46	4.68		0.83	0.0	17	16	3	12	s.	A. C. Heyburn.
North Hammond	St. Lawrence	300	20																	
North Lake	Herkimer	1,822	8	62.4		87	15	40	5	37	4.49		1.07	0.0	8	11	8	12	nw.	H. A. Pauls.
Ogdensburg	St. Lawrence	175	17	67.1	- 2.2	89	15	44	20	35	3.98	+ 0.26	0.80	0.0	13	10	5	16	sw.	State Hospital.
Old Forge	Herkimer	1,733	1	62.7		87	15	36	9	44	4.35		0.84	0.0	14	10	16	5	w.	Stuart W. Nelson.
Oswego	Oswego	335	39	66.6	- 3.0	85	12	51	9	23	4.39	+ 1.16	2.76	0.0	9	11	13	7	w.	U. S. Weather Bureau.
Otto	Cattaraugus	1,410	5																	
Palermo	Oswego	460	50								1.83	- 1.50	0.52	0.0	10	19	8	4	sw.	E. B. Bartlett.
Perry City	Schuyler	1,038	19	68.8	- 0.2	93	11	39	9	48	1.76	- 2.58	0.68	0.0	9	11	17	3	nw.	W. H. Jeffers.
Philadelphia	Jefferson	485	3	67.4		86	15	44	7	34	4.76		0.90	0.0	14	5	23	3	w.	E. D. Babcock.
Plattsburg	Clinton	170	50																	
Potsdam	St. Lawrence	300	33	67.3	- 1.0	92	15	44	7	36	3.74	- 0.44	0.82	0.0	11				nw.	Lloyd W. Weed.
Raquette Lake	Hamilton																			
Rochester	Monroe	523	80	69.2	- 1.2	89	12	50	5	30	3.49	+ 0.40	1.12	0.0	12	12	10	9	sw.	U. S. Weather Bureau.
Romulus	Seneca	719	17																	
Scottsville	Ontario	740	10	68.4		87	10	47	7	31	4.28		1.06	0.0						
Shortsville	do										3.45		0.93	0.0	12	18	9	4	w.	F. Budlong.
Skaneateles	Onondaga										3.27		1.06	0.0	9					
Syracuse	do	597	7	68.4		88	15	50	9	30	1.72	- 1.96	0.81	0.0	9	9	13	9	s.	Edward Conson.
Thonondaga	Essex	344	11	68.4		97	30	47	7	34	2.20		0.69	0.0	7	15	8	8	s.	U. S. Weather Bureau.
Trudeau	do	1,620	16																	
Volusia	Chautauqua	1,187	10	67.7	- 0.6	90	12	44	5	30	2.61	- 1.36	1.23	0.0	7	16	10	5	sw.	Benjamin Breads.
Watertown	Jefferson	737	16	67.6	- 2.1	83	15	48	4	30	3.60	- 0.19	0.86	0.0	16	14	11	6	sw.	H. P. Dunlap.
Wedgwood	Schuyler	1,430	20	68.8	- 1.1	92	15	47	5	33	1.13	- 2.19	0.50	0.0	7	17	12	2	sw.	O. F. Corwin.
Westfield	Chautauqua	837	13	67.3	- 3.7	86	10	47	5	26	2.85	- 1.67	1.06	0.0	5				sw.	John R. Rogers.
Youngstown	Niagara										3.12		0.76	0.0	10	12	19	0	sw.	B. V. Brookins.
<i>Vermont.</i>																				
Burlington	Chittenden	404	3	66.4		88	15	45	9	30	4.06		2.48	0.0	14	6	14	11	s.	U. S. Weather Bureau.
Cornwall	Addison	507	17	67.8	- 3.1	92	28	43	9	35	2.79	- 0.97	0.55	0.0	11	10	16	5	s.	C. H. Lane.
Enosburg Falls	Franklin	601	19	65.4	- 2.2	90	15	40	7	37	3.10	- 2.24	0.84	0.0	16	14	10	7	n.	L. H. Pomeroy.
Northfield	Washington	876	24	62.8	- 3.8	86	15	39	7	36	2.53	- 1.17	0.61	0.0	14	7	17	7	sw.	U. S. Weather Bureau.
Walls	Rutland	750	18	65.7	- 3.3	88	15	43												

TABLE 2.—Daily precipitation for July, 1909. District No. 4, Lake Region.

Table with columns for Stations, River basins, Day of month (1-31), and Total. Rows are grouped by state: Minnesota, Wisconsin, Illinois, Indiana, Michigan.

TABLE 3.—Maximum and minimum temperatures at selected stations, July, 1909. District No. 4, Lake Region.

Date.	Wisconsin.												Michigan.															
	Duluth, Minn.		Florence.		Green Bay.		Milwaukee.		Chicago, Ill.		Fort Wayne, Ind.		Alpena.		Battle Creek.		Cadillac.		Detroit.		Escanaba.		Ewen.		Houghton.		Marquette.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1...	82	60	84	60	84	66	78	65	75	70	93	61	82	61	85	63	87	72	85	66	80	61	80	42	78	60	71	59
2...	62	49	72	53	89	54	91	56	91	59	90	59	64	52	85	56	76	53	80	69	69	49	81	52	05	48	67	46
3...	64	46	65	40	70	50	64	53	63	55	81	59	68	48	73	55	67	49	70	55	65	46	74	53	64	47	60	46
4...	71	52	77	40	68	50	65	53	63	58	75	49	73	43	70	46	74	42	73	54	68	46	74	37	73	51	71	50
5...	76	55	77	49	73	50	66	56	65	59	67	58	75	47	77	50	80	46	75	80	68	50	78	43	77	54	71	54
6...	66	52	82	47	77	52	69	57	66	59	78	56	75	49	89	51	85	50	78	80	72	52	82	42	72	53	66	50
7...	65	50	81	48	80	59	76	60	74	63	83	58	75	49	81	55	84	55	77	56	75	56	84	44	78	52	66	49
8...	70	51	84	59	81	58	76	60	76	64	85	53	80	52	81	51	86	50	79	53	73	54	83	50	83	56	82	62
9...	83	59	81	60	87	59	86	62	88	66	90	55	78	55	87	53	84	50	84	62	76	57	84	64	84	59	89	61
10...	81	58	79	51	87	67	82	72	85	71	86	63	85	60	86	65	82	65	85	60	81	64	79	52	77	58	75	62
11...	65	48	74	64	83	63	73	66	80	70	89	62	72	57	85	68	82	62	83	69	74	63	80	41	76	55	73	59
12...	72	49	81	64	82	67	83	69	84	70	91	63	85	62	87	60	86	66	90	67	80	63	74	48	62	51	73	61
13...	74	55	79	59	84	62	75	65	84	66	86	62	77	60	83	62	83	58	78	64	75	59	80	49	74	58	68	55
14...	65	52	74	60	86	63	85	64	85	64	85	63	83	63	84	54	85	58	87	66	81	67	69	58	81	50	71	56
15...	73	57	69	53	81	60	83	68	86	71	88	65	81	60	81	62	81	61	82	66	78	58	73	55	71	58	75	59
16...	72	55	79	45	76	58	80	62	80	65	83	62	72	54	78	60	77	57	78	62	70	54	75	52	69	55	66	53
17...	81	57	84	56	84	56	77	61	85	66	83	56	79	48	80	52	80	46	80	56	73	49	79	42	79	54	75	55
18...	66	52	72	45	72	55	72	58	75	64	80	64	71	55	75	54	72	52	74	60	71	52	78	41	68	49	63	55
19...	58	51	72	39	75	50	70	54	69	63	78	49	78	48	78	48	81	48	76	55	73	49	72	43	75	48	66	55
20...	84	55	74	57	84	61	83	60	82	65	83	50	74	51	81	50	80	50	78	63	65	57	72	53	75	59	67	59
21...	75	58	75	64	85	68	87	63	87	65	87	54	85	61	85	57	81	56	83	68	69	62	69	53	75	65	74	63
22...	74	58	74	57	82	61	81	62	85	64	86	64	84	64	80	65	82	66	81	65	70	57	70	55	66	56	68	55
23...	74	57	79	52	74	59	76	60	72	63	80	61	71	58	78	59	73	58	70	58	71	57	70	45	71	56	69	55
24...	80	56	78	49	82	55	79	57	78	59	83	51	78	53	78	52	78	52	78	55	80	56	76	49	77	55	76	59
25...	78	63	82	50	85	58	84	62	85	65	86	50	85	55	83	52	85	54	82	58	74	55	81	52	82	60	83	65
26...	72	59	80	58	81	63	75	64	76	67	81	58	85	58	81	60	84	60	80	65	76	62	81	50	82	62	83	62
27...	72	62	77	51	79	58	73	62	74	65	79	63	79	57	81	61	88	57	79	68	76	58	85	52	80	60	78	62
28...	84	58	81	58	85	63	84	66	90	72	90	64	83	64	90	62	94	55	86	68	73	66	80	51	85	60	81	65
29...	80	62	82	65	95	70	95	74	92	77	87	74	93	64	87	70	90	70	85	70	83	62	79	49	77	63	80	67
30...	79	56	80	53	87	65	79	67	79	69	89	64	82	58	88	65	85	59	84	68	79	59	82	54	78	60	73	61
31...	69	54	81	50	82	61	79	67	79	72	80	64	79	60	85	65	88	56	81	67	75	60	80	49	71	56	72	58
Mns	73.1	54.9	77.6 ^b	53.5 ^b	81.3	59.4	78.4	62.1	79.1	65.5	84.1	59.2	78.2	55.4	81.7	57.6	81.7	56.0 ^a	79.8	62.3	73.7	56.5	77.9	48.8	74.7	55.9	72.6	57.3

Date.	Michigan.						Ohio.						New York.						Vermont.									
	Muskegon.		Saginaw, W.S.		Sault Ste. Marie.		Cleveland.		Lima.		Sandusky.		Toledo.		Erie, Pa.		Buffalo.		Canton.		Rochester.		Syracuse.		Burlington.		Northfield.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1...	81	67	87	66	72	51	75	64	87	60	81	65	84	69	75	67	72	67	81	62	82	67	79	67	77	59	75	54
2...	79	59	78	55	57	49	80	66	85	60	86	67	84	63	75	60	70	61	68	52	73	59	70	58	64	55	64	48
3...	68	52	71	50	57	46	72	58	80	60	73	60	70	57	75	56	70	55	60	52	64	55	63	54	59	53	64	52
4...	71	49	74	45	65	46	65	57	77	56	70	60	72	54	67	55	67	52	69	47	69	53	63	53	67	53	64	44
5...	75	47	81	47	76	54	70	52	73	50	73	57	75	59	71	52	68	57	73	50	77	50	74	54	71	50	69	43
6...	77	52	80	53	77	51	71	58	76	56	73	59	75	58	73	57	77	59	73	48	75	53	74	56	70	52	69	44
7...	84	52	81	56	80	53	73	63	82	60	74	67	76	57	74	59	76	56	76	45	77	52	74	52	73	47	72	39
8...	85	54	85	49	82	51	75	59	83	55	76	62	77	58	76	55	73	63	70	49	79	55	74	59	65	54	64	46
9...	84	56	89	54	88	56	82	58	85	57	81	62	86	66	79	59	80	58	78	42	84	54	80	50	75	45	75	39
10...	80	68	89	67	73	56	87	65	85	65	90	66	87	66	86	70	80	70	78	53	85	61	83	64	77	56	80	44
11...	78	51	90	68	80	51	80	66	79	68	84	70	83	69	82	70	83	66	83	66	85	66	86	66	79	58	82	59
12...	82	62	88	70	76	49	91	67	90	67	93	68	90	67	89	67	78	68	83	69	89	67	87	68	84	68	85	61
13...	79	64	83	59	75	51	76	67	83	64	78	66	77	61	75	66	71	68	79	62	77	64	81	65	84	65	85	64
14...	84	66	87	64	79	50	82	67	85	66	82	67	85	67	80	63	80	63	83	58	83	60	83	60	83	61	80	56
15...	79	63	80	64	76	56	81	63	85	65	85	65	84	61	80	68	78	69	88	58	87	65	88	63	88	60	86	51
16...	76	64	83	58	63	51	76	66	80	65	79	63	80	64	76	68	75	68	76	61	80	65	78	60	76	59	78	56
17...	79	50	82	50	75	51	72	64	76	58	77	64	79	58	71	63	73	61	77	59	75	61	72	60	74	60	72	54
18...	75	61	78	58	66	49	72	64	78	61	74	64	75	61	71	62	70	59	68	54	71	58	67	55	73	57	71	48
19...	69	49	82	48	71	50	69	62	75	57	73	63	76	55	72	59	69	56	71	62	72	57	69	56	68	54	64	48
20...	75	52	82	52	66	51	73	54	79	51	77	58	81	59	74	55	73	57	74	53	78	53	74	56	73	51	69	45
21...	75	61	87	66	73	58	82	64	85	63	86	65	85	66	83	61	89	60	79	49	77	54	77	53	77	50	78	44
22...	78	60	84	65	71	60	83	62	83	63	83	64	83	65	81	65	76	67	76	60	72	62	71	62	78	55	79	49
23...	69																											